

LANDAU, A.I.  
PALATNIK, L.S. LANDAU, A.I.

Theory of equilibrium diagrams of heterogeneous multicomponent  
systems. Uch.zap. KHGU 71:41-46 '56. (MIRA 10:8)  
(Phase rule and equilibrium)  
(Systems (Chemistry))

LANDAU, A.I.  
PALATNIK, L.S.; LANDAU, A.I.

Differential correlations of the generalized rule of the "center of gravity" and their application to variant physicochemical processes.  
Uch.zap. KHGU 71:47-54 '56. (MIRA 10:8)  
(Chemistry, Physical and theoretical)

LANDAU, A.I.

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The rule of contiguous regions of phase separation in multicomponent heterogeneous systems. Uch.zap. KHGU 71:55-58 '56. (MLRA 10:2)  
(Phase rule and equilibrium) (Systems (Chemistry))

Landau, A. I.

Distr:  $hE^2$

Effect of diffusion of admixtures in the melt on their distribution within crystals during the directional influence of the crystallization. 21. Statement of the problems in terms of partial-derivative functions and the method of solution. A. I. Landau. *Russ. Kristallogr. Akad. Nauk S.S.S.R., Int. Symp. Vsesoyuz. Sverkhaniya*, 1956, 74-81 (Pub. 1957). Asymptotic equations were derived describing the stabilized concentrational peaking of admixt. in the melt near the borderlin of the crystn. A. P. Koltoby

Landau A.I.

The structure of equilibrium diagrams of multicomponent  
heterogeneous systems // I. S. Piatnitskii and A. I. Landau  
Proc. Acad. Sci. U.S.S.R., Sect. Chem. 169, 490-501 (1958)  
(English translation) — See C.A.B. 1, 14400g. B.M.R. //

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PALATNIK, L.S.; LANDAU, A.I.

Structure of the equilibrium diagrams of multicomponent heterogeneous systems. Dokl. AN SSSR 109 no.5:954-957 Ag. 1956. (MLRA 9:10)

1. Khar'kovskiy gosudarstvennyy universitet imeni A.M. Gor'kogo.  
Predstavleno akademikom I.I. Chernyshevym.  
(Phase rule and equilibrium)

LANDAU, A. I.

Obobshchennaya Formulya Nera-  
venstva Gibbsa. L. S. Pribludnik and A.  
I. Landau. AN SSSR, Dokl., June 1957, pp. 837-840. In Russian. Pres-  
entation of a generalized formulation of  
Gibbs inequality.

16 ill.

S/564/57/000/000/005/029  
D258/D307

AUTHOR: Landau, A. I.

TITLE: The effect of the diffusion of admixtures in a melt on their distribution in the crystal during directional crystallization

SOURCE: Rost kristallov; doklady na Pervom soveshchanii po rostu kristallov, 1956 g. Moscow, Izd-vo AN SSSR, 1957, 74-81

TEXT: The distribution of small admixtures along the axis of monocrystals is studied as a function of initial admixture concentration in the melt, their diffusion coefficients  $D$ , rate of crystal growth, and magnitude of the equilibrium purification coefficient. Partial differential equations describing the admixture distribution in the melt at any moment are given and methods of solution are indicated. An asymptotic equation describing the increase in the admixture concentration near the crystal is obtained, which shows that a higher concentration

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The effect of the...

layer is formed and the admixture then enters uniformly into the crystal in concentration equal to the initial concentration of the admixture in the melt. Thickness of this layer is estimated from this equation as  $\lambda = D/v$ , where  $v$  is the rate of crystal growth. While this layer is established, the crystal grows by a characteristic length  $\lambda$  for which an expression is derived in terms of  $D$  and  $v$ ; the dependence of  $\lambda$  on the purification coefficient is estimated. Equations are given for the distribution of admixtures along the monocrystal and in the melt around the growing crystal. There are 4 tables.

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LANDAU, A.I.

Topological investigation of an equilibrium diagram of multi-component heterogeneous systems in their nonnodal sections, using the rule of contiguous separation regions. II. In: S. Palatnik and A. I. Landau (A. M. Gor'kiy State Univ., Kharkov), Zhur. fiz. khim. 31, 391-44 (1957); cf. ibid. 30, 2390 (1956); C.A. 50, 14234, 9847g. Multidimensional equil. diagrams in nonnodal sections of the equil. diagram of multi-component heterogeneous systems were studied topologically by use of the rule of contiguous sepn. surfaces. With  $k$ -dimensional equil. diagrams and sections (where  $k$  may have any value), the figure which corresponds to the sepn. regions was studied topologically. The figure adjoining the  $k$ -dimensional space in a point, line, 2-dimensional surface, a 3-dimensional hypersurface, etc., up to (and including) an  $(k-1)$ -dimensional hypersurface, with an investigation of the phase distribution in this region. Formulas were derived to det. the no. of the different-dimensional geometric elements in the figures that formed the sepn. regions adjoining to the  $k$ -dimensional equil. diagram through an  $m$ -dimensional hypersurface. The principle of the min. no. of geometric elements is announced. Isochore sections ( $P$  vs.  $T$  const.) and isobaric-isothermal sections ( $P$  and  $T$  vs. const.) at sepn. below the eutectic equil. with a simple picture of limited solid solub. are discussed by way of example, and the soln. distribution is discussed in the sepn. regions of their sections, and the isochore and isobaric-isothermal sections were found to be topologically equiv. W. M. Sternberg

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**AUTHORS:** LANDAU, A.I. Palatnik, L.S., Landau, A.I. 76-12-21/27

**TITLE:** Heterogeneous Systems With Many Components and a Non-Maximal Order of the Concentration-Matrix (knogokomponentnyye geterogennyye sistemy s nemaksimal'nyim rangom matritsy kontsentratsiy).

**PERIODICAL:** Zhurnal Fizicheskoy Khimii, 1957, Vol. 31, Nr 12, pp.2739-2747 (USSR)

**ABSTRACT:** First the distribution of the thermodynamic degrees of freedom in systems with a non-maximal order of the concentration matrix is dealt with. Referring to ref. 2, it is shown that a whole series of heterogeneous systems with many components with a defect of the matrix  $\sigma > 0$  can exist. It was shown that the case  $\sigma = 1$  at  $r \leq n$ , dealt with by Gibbs [Ref.1] and Storonkin [Ref.3], is only a special case, whereas the number of possible thermodynamic systems with  $\sigma > 0$  is essentially greater. Certain heterogeneous systems with many components and with both a pressure- and temperature extreme, such with equal composition of concentration of various phases (e.g. of phases in points of equal concentration, of allotropic phases), as well as some systems with many components where not all components participate in the individual phases of the system, belong to these systems.

In the concentration-matrix  $\| x_{ij} \| (i=1,2,\dots, n; j=1,2,\dots, r)$ , in which case each  $x_{ij}$  is a concentration of the  $i$ .component in the  $j$ .

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phase ( $n$  and  $r$  is the number of components, or of the phases of the system respectively) it is assumed that the defect  $\sigma$  of the concentration-matrix is equal to zero [Ref.1]. The inequality  $r \leq n + 2$ , set up by Gibbs, can be generalized for all these enumerated systems. For this purpose the value  $\chi$  (kappa) is introduced. This is the greatest of the numbers  $r - n$  and  $0$ .  $\chi = \max \{r - n, 0\}$  and the inequality of Gibbs reads then  $0 \leq \chi \leq 2$ , and the generalized form of it is  $0 \leq \chi + \sigma \leq 2$ . Equations (7) are derived here. These equations form the conditions which are imposed to the concentration  $x_{ij}$  of the thermodynamic system and which are correlated with the value  $\sigma$  by means of the equality of the concentration-matrix-defect, where  $\sigma \geq 0$ , and each  $\mu_{ij}$  in the equation (5) represents the chemical potential of the  $i$ . component in the  $j$ . phase. It is shown that the sense of the equation (4) ...  $0 \leq \chi + \sigma \leq 2$  consists in that, that with  $\sigma + \chi > 2$ , in the basic equations (5)-(7), which express the investigated open thermodynamic system, an indetermination arises in any arbitrary case and that also when the pressure and temperature of the system are not previously fixed. A redundancy in determination arises in the set of equations (5) to (7) at  $\sigma = 0$  and  $\chi > 2$ . It is shown that the nonvariant-determination of the variables at

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$\sigma + \chi = 2$ , or the monovariant-determination of the variables at  $\sigma + \chi = 1$ , in the general case does not belong to the whole equation-system (5) to (7), but to an individual group of this system of equations. The generalizing terms of the nonvariant and monovariant state of a thermodynamical system are given in the second part of the work. It is shown that at  $\sigma + \chi = 2$  in the thermodynamical system a certain group of phases which is in nonvariant equilibrium ( $y_1=0$ ) with each other, must be contained, whereas all other phases of the same system in the general case can have a degree of freedom  $y_2 = y \geq 0$ , different from zero. Thereby, the total amount of degree of freedom of the thermodynamical system is equally equal to  $y$ , and can be greater than 0:  $y \geq 0$ . Such a state of the thermodynamical system, in which case a part of the phases is in nonvariant equilibrium, whereas the total-amount of thermodynamical degrees of freedom of the system  $y$  in the general case can be different from 0, is called by the authors the nonvariant state of the thermodynamical system. consequently, the conception of the nonvariant state of the thermodynamical system is a more general term than that of the nonvariant equilibrium, provided that the total amount

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Order of the Concentration-Matrix

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of the degrees of freedom of the system is equal to zero. In the special case  $y = 0$ , all phases of the given system are in nonvariant equilibrium. In such a case the terms of nonvariant state and nonvariant equilibrium coincide. Analogously it is shown that a thermodynamical system at  $\sigma + \chi = 1$  is in monovariant state, i.e. it contains a certain group of phases which are in monovariant equilibrium ( $y_1 = 1$ ) with each other, whereas the other phases of the system in the general case have a greater number of degrees of freedom. Concluding, examples are given. There are 3 Slavic references.

ASSOCIATION: Khar'kov State University imeni A.M. Gor'kiy (Khar'kovskiy gosudarstvennyy universitet im. A.M.Gor'kogo).

SUBMITTED: October 17, 1956

AVAILABLE: Library of Congress

Card 4/4

20-114-4-43/63

**AUTHORS:** Palatnik, L. S., Landau, A. I.

**TITLE:** A Generalized Formulation of Gibbs Inequality (Obobshchennaya formulirovka neravenstva Gibbsa)

**PERIODICAL:** Doklady Akademii Nauk SSSR, 1957, Vol. 114, Nr 4, pp. 837-840 (USSR)

**ABSTRACT:** The terms  $V$ ,  $S$ ,  $P$ ,  $T$  mean: volume, entropy, pressure and temperature of the total heterogeneous system.  $M_1$  and  $\mathcal{M}_1$ , on the other hand, mean the quantity and the chemical potential of the  $i$ -th-component in the whole system; further  $v_j$ ,  $s_j$ ,  $m_j$  denote the specific volume, specific entropy and the mass of the  $j$ -th-phase of the system;  $x_{ij}$  and  $\mu_{ij}$  are the concentration and the chemical potential  $i$ -th-component in the  $j$ -th-phase;  $n$  and  $r$  denote the number of components and the number of phases in the system. In the case of an analytical study of the thermodynamic systems it is usually considered a foregone conclusion that the rank of this matrix is a maximum, i.e. that its defect is  $\sigma = 0$ . Thus the phase rules and the inequality deduced by Gibbs  $r \leq n + 2$  concern only such thermodynamic systems with  $\sigma = 0$ . One can, however, imagine really existing thermodynamic systems with a  $\sigma > 0$ .

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## A Generalized Formulation of Gibbs Inequality

They were mentioned by Gibbs and discussed more in detail by Storonkin. As may be seen from the following, the case of a system with  $\sigma = 1$  at  $r \leq n$  is only a special one, and the number of possible systems with  $\sigma > 0$  is considerably higher. To this belong certain thermodynamic systems with a pressure- and temperature maximum, with equal concentration composition of various phases, some systems in whose individual phases not all components participate. It is the purpose of the present paper to determine the rules to which the systems with  $\sigma > 0$  are subjected. If any additional conditions are added to a thermodynamic system, these conditions have to be added apparently to the equations of Gibbs-Duhem or to the equality of the chemical potentials before computing the number of the thermodynamic degrees of freedom of a system. In the present case the additional conditions are those connected with the equality of the defect of the concentration matrix by the value  $\sigma$ , where  $\sigma \geq 0$ . Furthermore the equations of the chemical potentials are discussed together with the above-mentioned conditions. Then follow in an analogous manner the equations of Gibbs-Duhem together with the conditions of the non-maximum of the matrix rank. From the results obtained the meaning of the conditions  $0 \leq \sigma + \chi \leq 2$  (7) becomes clear.

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20-114-4-43/63

$\sigma + \kappa > 2$ .

There are 9 references, 9 of which are Soviet.

ASSOCIATION: Khar'kovskiy gosudarstvennyy universitet im. A. M. Gor'kogo  
(Kharkov State University imeni A. M. Gor'kiy)

PRESENTED: December 26, 1956, by N. V. Belov, Member, Academy of  
Sciences, USSR

SUBMITTED: February 17, 1956

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LANDAU, A.I.

3(8) p 3 PHASE I BOOK EXPLOITATION SOV/1310

Soveshchaniye po eksperimental'noy i tekhnicheskoy mineralogii i petrografii, 5th Leningrad, 1956.

Trudy... (Transactions of the Fifth Conference on Experimental and Applied Mineralogy and Petrography) Moscow, Izd-vo AN SSSR, 1958. 516 p. 1,800 copies printed.

Sponsoring Agency: Akademiya nauk SSSR. Institut geologii rudnykh mestorozhdeniy, petrografii, mineralogii i geokhimii, and Akademiya nauk SSSR. Institut khimii silikatov.

Resp. Ed.: Tsvetkov, A.I.; Ed. of Publishing House: Ivanov, B.V.;  
Tech. Ed.: Kiseleva, A.A.

PURPOSE: This book is intended for scientists and students of mineralogy and petrography.

COVERAGE: The present collection of articles are reprints of reports presented at the Fifth Conference on Experimental and Applied Mineralogy and Petrography, held in Leningrad on March 26-31, 1956. The

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Transactions of the Fifth Conference (Cont.)

SOV/1310

purpose of the Conference was to exchange information and coordinate the activities in the fields of experimental and applied mineralogy and petrography, and to stress the increasing complexity of practical problems. The Conference was sponsored by the Academy of Sciences of the USSR and organized by its Institute of Ore Deposits, Geology, Petrography, Mineralogy and Geochemistry of the Division of Geological-Geographical Sciences, and the Institute of Silicate Chemistry of the Division of Chemical Sciences. During the Conference special tribute was paid to Academician D.S. Belyankin, (died 1952), founder of applied petrography in the USSR and organizer of the first four conferences and Academician A.N. Zavaritskiy, (died 1953), outstanding petrographer and mineralogist. Of the 76 reports presented, 53 are reprinted in the present volume. Each article is accompanied by diagrams, tables, and bibliographic references.

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Transactions of the Fifth Conference (Cont.)

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AUTHORS: Palatnik, L. S. , Landau, A.I.

TITLE: Problems on the General Theory of the Equilibrium Diagrams of Polycomponent Heterogeneous Alloys (Voprosy obshchey teorii diagramm ravnovesiya mnogokomponentnykh geterogennykh splavov)

PERIODICAL: Zhurnal Neorganicheskoy Khimii, 1958, Vol.3, Nr 3, pp.637-649 (USSR)

ABSTRACT: The problem of the general topological and analytical theory of polycomponent heterogeneous alloys, their equilibrium diagrams and the sections of the equilibrium diagrams were treated. The peculiarities of the topological method of N. S. Kurnakov, as well as the analytical method of Gibbs were discussed. The results of the application of the topological analytical theory to the thermodynamic problem of polycomponent heterogeneous alloys were used. The suggested method for the determination of the chemical composition of phases by their mass is also employed in the heterogeneous phases with any number of phases and components. Different thermo-

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Problems on the General Theory of the Equilibrium Diagrams of Polycomponent Heterogeneous Alloys

dynamic degrees of freedom were introduced: an extensive and an intensive degree of freedom. The formula for the calculation of the extensive thermodynamic degree of freedom is as follows:

$$y_{\text{ext}} = q_{\text{ext}} + q_{\text{int}} + K$$

The polycomponent heterogeneous alloys with pseudoextreme pressure and temperature are considered alloys with a small number of components, whereby the investigation and construction of the polycomponent heterogeneous alloys is facilitated. Special potential functions can also be introduced in these calculations. The employment of the topoanalytical theory for investigations of the geometric construction of the equilibrium diagrams of polycomponent heterogeneous alloys was studied. There are 8 figures and 21 references, 21 of which are Soviet.

ASSOCIATION: Khar'kovskiy gosudarstvennyy universitet im. A. M. Gor'kogo  
(Khar'kov State University imeni A. M. Gor'kogo)  
SUBMITTED: June 25, 1957

Card 2/2

AUTHOR: Landau, A. I.

SOV/126-6-1-20/33

TITLE: The Wavelike Distribution of Impurities Along a Growing Monocrystal (K voprosu o volnoobraznom kharaktere raspredeleniya primesi vdol' dliny rastushchego monokristalla)

PERIODICAL: Fizika Metallov i Metallovedeniye, 1958, Vol 6, Nr 1, pp 148-156 (USSR)

ABSTRACT: The modes of growth which can result in a periodic impurity distribution are discussed in relation to possible causes, and a phenomenological theory is proposed. Experimental data given by others on NaI(Tl) and Sb in Ge (grown by the Stockbarger and Kyropoulos techniques respectively) are considered. The effects are discussed in terms of the supercooling required to continue crystallization as the 'impurity' is rejected by the growing crystal and accumulates ahead of it, followed by a fresh nucleation as the supercooling passes some critical point. This scheme is considered in relation to Figs. 2, 4 and 5 (Figs. 1 and 3 relate to the experimental data referred to above). Much of

Card 1/2 the discussion relates to or derives from a paper by the

SOV/126-6-1-20/33

The Wavelike Distribution of Impurities Along a Growing Mono-crystal

author given at the first All-Union Conference on Crystal Growth (now available in English); the mathematical treatment given in the last section of the paper merely formalizes the general arguments. The final result is obtained by inserting some rather hypothetical figures into the formulae, to obtain good agreement with the data of Burton et alii (Ref.3). There are 5 figures, 25 equations, 1 table and 14 references, 6 of which are Soviet, 7 English, 1 German.

ASSOCIATION: Khar'kovskiy filial instituta khimicheskikh reaktivov (Kharkov Branch of the Institute of Chemical Reagents)

SUBMITTED: November 16, 1956

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1. Single crystals--Impurities
2. Single crystals--Growth
3. Single crystals--Temperature factors
4. Chemical impurities--Distribution

24(6)  
AUTHORS: Palatnik, L.S., Landau, A.I. SOV/57-28-10-35/40

TITLE: Determination of the Phase Composition of an Equilibrium Multi-Component System According to the Method of Measuring Phase Mass (Opredeleniye sostava faz ravnovesnoy mnogokomponentnoy sistemy po sposbu zamera mass faz)

PERIODICAL: Zhurnal tekhnicheskoy fiziki, Vol. 28, Nr 10, pp 2340-2343 (USSR) 1958

ABSTRACT: Firstly, the difficulties encountered in the ordinary chemical or physicochemical analysis of the concentration composition of the phases of heterogeneous multi-component systems are exposed. In this paper, an analytical method of determining the chemical composition of the phases of equilibrium multi-component heterogeneous systems is advanced, which does not necessitate a chemical or physicochemical analysis of these phases. This method operates with measurements of the phase masses. It is based upon the application of the generalized "center of gravity" rule (Ref 1) and it represents the most simple method for the case under review of heterogeneous r-phase, n-component systems, the number of phases r being equal to n, n + 1, or n + 2. This method requires a number of r different experiments. In each of these experiments a different total concentration of the components in the

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Determination of the Phase Composition of an Equilibrium SOV/57-23-10-35/40  
Multi-Component System According to the Method of Measuring  
Phase Mass

heterogeneous system is assumed and the absolute masses of all phases of the system are determined. The experimental information thus collected makes possible a computation of the concentrations of the component in the individual phases of the system, using formula (6), which is ~~derived~~ <sup>given</sup> in this paper. This formula (6) specifies the relation between the wanted concentrations, the total concentrations of the components in the whole system and the masses of the individual phases of the system. There are 3 references, 3 of which are Soviet.

SUBMITTED: April 13, 1956

Card 2/2

AUTHORS: Palatnik, L. S., Landau, A. I.,  
Zorin, V. S.

76-32-3-17/43

TITLE: Phase Diagrams of Thermodynamic Systems With a Non-maximum Rank of the Concentration Matrix (Diagrammy sostoyaniy termodinamicheskikh sistem s nemaksimal'nyy rangom matritsy kontsentratsiy)

PERIODICAL: Zhurnal Fizicheskoy Khimii, 1958, Vol. 32, Nr 3,  
pp. 608-615 (USSR)

ABSTRACT: In studying equilibrium diagrams, the basic method of topology is used, whereby geometrical figures are divided into their simplest elements - simplexes. Hyperconnodes are such elements.

By this method, it is possible to facilitate the analytical investigations of the phase-equilibrium conditions. The present paper investigates diagrams of equilibrium systems in which a non-zero effect of the matrix of concentration  $\sigma$  is possible. Equations for systems with a certain number of phases are given, and then considerations of the problems of diagram topology for equilibrium of

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Phase Diagrams of Thermodynamic Systems With a Non-maximum Rank of the Concentration Matrix 76-32-3-17/43

these systems, with the use of a given position matrix that is denoted as an expanded position matrix, are explained. From the derivation of hyperconnodic systems with a non-maximum rank of the concentration matrix it follows that by the degeneration of the hyperconnodes, a contract boundary of the separating domains is attained, where this region of boundary contacts is considered as a characteristic domain. Some examples of characteristic domains for equilibrium diagrams of three-component and four-component systems are given, where the concentration matrices and the diagrams of isobars are given. The hyperconnodes on the diagram  $P, T, X_1$  represent simplexes with the magnitude  $l = r-1-M-\sigma$ , where for the case  $M + \sigma > 0$  (the characteristic domain) the simplexes appear degenerate. In the conclusion, it is emphasized that the study of the hyperconnodes may facilitate further investigations of the systems with  $\sigma > 0$  and of the processes occurring in them, where systems of a non-maximum rank can also be investigated.

Card 2/3

Phase Diagrams of Thermodynamic Systems With a Non- 76-32-3-17/43  
Maximum Rank of the Concentration Matrix

There are 4 figures and 7 references, 7 of which are  
Soviet

ASSOCIATION: Khar'kovskiy gosudarstvennyy universitet im. A. M. Gor'kogo,  
Khar'kovskiy politekhnicheskii institut im. V. I. Lenina  
(Khar'kov State University imeni A. M. Gor'kiy,  
Khar'kov Polytechnic Institute imeni V. I. Lenin)

SUBMITTED: November 12, 1956

Card 3/3

LANDAU , A.I., Cand Phys-Math Sci -- (diss) " Topo-analytical theory of multicomponent heterogenous systems." Khar'kov, 1959. 15 pp with drawings (Min of Higher Education UkSSR. Khar'kov Order of Labor Red Banner State U im A.M. Gor'kiy). 150 copies. Bibliography at end of text (14 titles) (KL,37-59, 106)

8

PALATNIK, Lev Samoylovich; LANDAU, Aleksandr Isaakovich; KOPELIOVICH,  
I.M., kand.fiz.-matem.nauk, otv.red.; VAYNBERG, D.A., red.;  
BELOKON', V.V., tekhn.red.

[Phase equilibrium in multicomponent systems] Fazovye ravnovesiia  
v mnogokomponentnykh sistemakh. Khar'kov, Izd-vo Khar'kovskogo  
gos.univ. im. A.M.Gor'kogo, 1961. 405 p. (MIRA 15:5)  
(Phase rule and equilibrium)  
(Thermodynamics)

LANDAU, A.I. (Kharkov)

Plotting two-dimensional polythermal sections of equilibrium diagrams of multicomponent eutectic systems by means of the projection method. Part 1: Topological structure of the projections of multicomponent systems. Zhur.fiz.khim. 35 no.11:2589-2597 N '61. (MIRA 14:12)

1. Nauchno-issledovatel'skiy institut osnovnoy khimii, Khar'kov.

(Systems(Chemistry))  
(Chemistry, Physical and theoretical)

S/161/62/004/010/013/063  
B108/B104

AUTHOR: Landau, A. I.

TITLE: The force of friction acting upon a moving dislocation

PERIODICAL: Fizika tverdogo tela, v. 4, no. 10, 1962, 2733 - 2737

TEXT: The frictional force acting on a moving dislocation and caused by the forced oscillations of the atoms in the slip plane is calculated using the Peierls-Nabarro model of a three-dimensional structure of the crystal (R. Peierls. Proc. Phys. Soc., 52, 34, 1940; F. R. N. Nabarro. Proc. Phys. Soc., 59, 256, 1947). It is assumed that the dislocation moves in the range of an atom between the times  $t_1 = -\infty$  and  $t_2 = +\infty$ , since the force acting on an atom in a slip plane has only a very short range. The force  $F$  acting upon a dislocation moving at a velocity  $v$  is obtained from the energy of the forced oscillations of frequency  $\omega = k\theta/\hbar$  ( $\theta$  - Debye temperature):

$$F = \frac{\mu^2 a_1 b}{2m} (\xi/v)^2 \exp(-2k\theta\xi/\hbar v). \quad (10)$$

Card 1/2

The force of friction...

S/181/62/004/010/013/063  
B108/B104

$\mu$  is the shear modulus,  $a_1$  is the lattice parameter in the direction parallel to the slip plane and perpendicular to the Burgers vector,  $b$  is the lattice parameter parallel to the Burgers vector,  $m$  is the mass of the atom, and  $\xi$  is the characteristic width of the dislocation ( $\sim 10^{-8}$  cm). The force  $F$  is only the dynamical part of the total friction. The force  $F$  is estimated for LiF showing that a fast (relativistic) motion of dislocations is impossible in crystals with a low Debye temperature. There is 1 figure. ✓

ASSOCIATION: Fiziko-tekhnicheskiy institut nizkikh temperatur AN USSR, Khar'kov (Physicotechnical Institute of Low Temperatures AS UkrSSR, Khar'kov)

SUBMITTED: February 21, 1962 (initially)  
May 7, 1962 (after revision)

Card 2/2

LANDAU, A.I. (Khar'kov)

Plotting of two-dimensional polythermal sections of equilibrium diagrams of multicomponent eutectic systems using the projection method. Part 3. Geometric shadow method and its application to quaternary eutectic systems. Zhur. fiz. khim. 36 no.4: 808-813 Ap '62. (MIRA 15:6)

1. Nauchno-issledovatel'skiy institut osnovnoy khimii.  
(Eutectics) (Phase rule and equilibrium)

L 13033-63 EWT(1)/EWP(q)/EWT(m)/BDS AFFTC/ASD/ESD-3 JD/JW/JG  
 ACCESSION NR: AP3000617 S/0181/63/005/005/1377/1385

AUTHOR: Pariyskiy, V. B.; Landau, A. I.; Startsev, V. I.

TITLE: Jerky motion of dislocations in single crystals of LiF

SOURCE: Fizika tverdogo tela, v. 5, no. 5, 1963, 1377-1385

TOPIC TAGS: dislocation, LiF, barrier, etching test, dislocation loop, annealing, dislocation motion, jerk, irregular motion, dislocation movement, dislocation jump

ABSTRACT: The authors have made a study of jerky movements of dislocations in single crystals of LiF with various impurity contents. The samples were given preliminary annealing treatment for 5 to 24 hours at 750-800C and then etched, either by a weak aqueous solution of Fe ions or by an etchant such as SR-4. No external stress was applied. The etching tests revealed multiple dislocation loops and jerky displacement of the ends of the loops. Time intervals between successive jumps were measured, and the velocity of dislocation motion proved to be on the order of 5 microns per second. The experimental results show that between repeated etchings of a particular crystal the intensity of jerky motion drops very markedly. Hardly a single new jump will occur between two successive etchings within a period of 1-2 minutes. The authors reject a number of possible

Card 1/2

L 13033-63

ACCESSION NR: AP3000617

3  
explanations previously proposed, and they conclude that the jerky motion is associated with periodic restraints placed on the dislocations at barriers. Such barriers may be dislocations of other slip systems, packing defects, accumulation of vacancies or impurity atoms, or other flaws. These barriers are removed successively by etching the crystal surface, freeing the end of the dislocation to move till it is pinned at a new barrier. "In conclusion, the authors express their gratitude to L. M. Soyfer for his aid in the work and also to Y. M. Borzhkovskaya for getting the manuscript ready for printing." Orig. art. has: 5 figures, 2 tables, and 2 formulas.

ASSOCIATION: Fiziko-tekhnicheskiy institut nizkikh temperatur AN USSR, Khar'kov  
(Physicotechnical Institute of Low Temperatures, Academy of Sciences, USSR)

SUBMITTED: 27Dec62

DATE ACQ: 11Jun63

ENCL: 00

SUB CODE: 00

NO REF SOV: 004

OTHER: 005

Cord 2/2

PARIYSKIY, V.B.; LANDAU, A.I.; BORZHKOVSKAYA, V.M.

Spontaneous jumps of dislocations in LiF single crystals. Fiz.  
tver tela 5 no.9:2570-2575 S '63. (MIRA 16:10)

1. Fiziko-tekhnicheskiy institut nizkikh temperatur AN UkrSSR,  
Khar'kov.

LANDAU, A.I.

Plotting of two-dimensional polythermal sections of equilibrium diagrams for multicomponent eutectic systems with the aid of the method of projections. Part 4: Application of the geometrical unfolding (shadows) method for the plotting of equilibrium diagrams for eutectic systems with an arbitrary number of components. Zhur. fiz. khim. 37 no.9:1933-1937 S '63.  
(MIRA 16:12)

1. Nauchno-issledovatel'skiy institut osnovnoy khimii, Khar'kov.

LANDAU, A.I. (Khar'kov)

Plotting of two-dimensional polythermal sections of equilibrium diagrams for multicomponent eutectic systems by means of the method of projections. Part 2. Zhur. fiz. khim. 36 no.3:463-468 Mr '62. (MIRA 17:8)

L 58993-65 EWT(1)/EWT(m)/T/EWP(t)/EEC(b)-2/EWP(b)/EWA(c) P1-4 IJP(c)  
 JD/GG UR/0181/65/007/007/2136/2146  
 ACCESSION NR: AP5017311 5143 B  
 AUTHOR: Borzhkovskaya, V. M.; Landau, A. I.; Pariyskiy, V. B.  
 TITLE: The investigation of slip lines in single crystals of LiF by means of graphs showing the statistical distributions of distances between etching depressions  
 SOURCE: Fizika tverdogo tela, v. 7, no. 7, 1965, 2136-2146  
 TOPIC TAGS: crystallography, slip band, plastic deformation  
 ABSTRACT: The statistical method was used to investigate the fine slip lines in single crystals of LiF during the early stages of plastic deformation. The method consists of measuring the distance between adjacent etching depressions along the slip line and the construction of graphs for the statistical distributions  $dN/dl$  where  $N$  is the number of measured distances with length less than or equal to  $l$ . The basic result of the work is the isolation of a series of maxima appearing on each graph and occupying approximately the same positions. These positions are independent of external loading and are the same for all slip lines formed by the out-lets of edge and spiral dislocations. This points to the existence of certain definite most probable distances between etching depressions governed by the internal

Card 1/2

L 58993-65

ACCESSION NR: AP5017311

structure laws of the investigated slip lines. The work considers the possible structure of the fine slip lines which could lead to the appearance of such maxima. A hypothesis is advanced that the existence of definite most probable distances between etching depressions in the slip lines is due to the interaction of dislocations contained in the bands with local detents. "In conclusion the authors express their gratitude to V. I. Startsev for constant interest in the work, to A. V. Stepanov, V. L. Indenbom, A. N. Orlov, A. M. Ratner and E. M. Nadgornyy for discussing the results." Orig. art. has: 3 figures, 1 table, 3 formulas.

ASSOCIATION: Fiziko-tekhnicheskii institut nizkikh temperatur AN UkrSSR, Kharkov (Physicotechnical Institute of Low Temperatures, AN UkrSSR)

SUBMITTED: 11May64

ENCL: 00

SUB CODE: SS

NO REF SOV: 009

OTHER: 010

Card 2/2

LANDAU, B.; PODKOWILSKI, J.

The pulp and paper industry in Austria. (To be contd.)

P. 86 (PRZEGŁAD PAPIERNICZY) (Łódź, Poland) Vol. 13, no. 3, Mar. 1957

SO: Monthly Index of East European Accession (EEAI) LC Vol. 7, No. 5, 1958

POLAND/Chemical Technology. Chemical Products  
and Their Applications. Cellulose and  
Its Derivatives. Paper.

H

Abs Jour : Ref Zhur-Khimiya, No 6, 1959, 21842

Author : Landau, Bruno; Podkewinski, Janusz

Inst :

Title : The Cellulose-Paper Industry in Austria.

Orig Pub : Przegl. papiern., 1957, 13, No 4, 103,  
117-120

Abstract : Characteristics of four cellulose-paper  
plants (technology of the process and ap-  
paratus, basic technico-economical indica-  
tors) and data on the planned objectives  
are cited. For Part I, see Ref Zhur- Geogr.,  
1958, 153757. -- Ya. Shteynberg

Card : 1/1

SUBJECT USSR/MATHEMATICS/Applied mathematics. CARD 1/1 PG - 58  
AUTHOR BELENJKIJ S.Z. LANDAU D.D.  
TITLE The hydrodynamic theory of the multiple generation of particles.  
PERIODICAL Uspechi fiz. Nauk 56, 309-348 (1955)  
reviewed 6/1956

Some presuppositions and quantitative computations by means of the thermodynamical theory of shock processes by Fermi must be doubted because of uncorrect treatment of the extension of the system. According to D.D.Landau (Izvestija Akad. Nauk 47, 51 (1953)) the extension can be dealt with on the basis of relativistic hydrodynamics. Different thermodynamic relations at the disintegration of the system are given and discussed. The following equation of state for the strongly compressed matter at very high temperatures is assumed: energy-density = 3\*pressure. The total number of particles amounts to about  $E^{1/4}$  ( $E$  = energy of the nucleons in the laboratory system). It follows the establishment and the discussion of the energy distribution and angular distribution of the particles. Taking the logarithms of energy and angle as abscissas these distributions are nearly a Gaussian distribution. For oscillations of particles with different masses the energy and the angular distributions are only slightly different.

LANDAU, E.

"Introduction to differential and integral calculus", (Vvedenie v differentsialnoe i integralnoe ischislenie), published by the State Publishing House for Foreign Literature, MOSCOW 1948.

SO: D-70905, 28 July 1954.

LANDAU, G.

Distr. 4820(j)

7  
New organic inhibitors for protecting steel from acid corrosion. I. V. Kukul'skiy, G. Landau, and A. Sochman. *Russ. chim. akad. resp. popovskiy Kourskii* 2, No. 1, 49-50 (1957).—As an index of inhibitory strength, the ratio  $S.I. = (\text{loss with no inhibitor}) - (\text{loss with it}) \times 100/I$  is used. The following S.I. values are reported for 32% HCl at 20° on sheets of C steel, a 0.25% inhibitor concn. being used: CH<sub>3</sub>O 95.0, urea 41.2, thiourea 47.8. A 1:2.5 urea-HCHO resin (most effective proportion) 97.2, 1:4 thiourea-HCHO resin 89.9 (mixed HCHO-urea-thiourea resins are less effective than are HCHO-urea resins), alkylbenzene sulfonates 3 (at concn. 0.02 g./100 ml.), Cu-Cu thiols 43, Kolorsiks (prepd. by condensing glycerol dichlorohydrin with H<sub>2</sub>N(CH<sub>2</sub>)<sub>2</sub>OH) 96.6, Rezofiks S.V. (resin based on dicyanodiamide and complex Cu salts) 97.3, Katsol (laurylpyridinium fluoride) 83.3. A mixt. of 0.25 g. of a 1:2.5 urea-HCHO resin with 0.1 g. Rezofiks/100 ml., 99.2; For a mixt. of 0.25 g. of the same resin and 0.1 g. Katsol/100 ml., 99.0.

John Howe Scott

6 MAY

LOSEV, P.P.; LANDAU, G.Ye.

Presses of papermaking machines equipped with diaphragm pneumatic pressure devices. Bum.prom. 33 no.11:22-23 H '58.  
(MIRA 13:8)

1. Proyektbummash.  
(Papermaking machinery)

LANDAU, H.

Let us economize with clinkers by using admixtures. p. 2

CONSTRUCTORUL, BUCURESTI, Vol 8, No. 326, Apr., 1956

SO:- East European Accessions List (EEAL) Library of Congress, Vol 5, No. 7, July, 1956

LANDAU, H.

RUMANIA / Chemical Technology, Chemical Products and Their  
Application. Part 2. - Ceramics, Glass, Binders,  
Concretes. - Binders, Concretes, and Other Silicate  
Building Materials.

H-13d

Abs Jour : Ref. Zhur. Khimiya, No 4, 1958, 12071.

Author : H. Landau, M. A. Serban.

Inst : Not given

Title : Computation of Mineralogical Composition of Cement Klinker  
and Its Influence on Cement Strength.

Orig Pub : Ind. constructiilor si mater. constr., 1957, No 4, 239 - 245.

Abstract : 3 computation methods are compared. It is noted that  
the Soviet method using nomographs is the most convenient  
and simplest.

Card 1/1

LANDAU, Ioan, ing.

The continuous-current differential amplifier with transistors.  
Automatica electronica 6 no.1:12-13 Ja-F '62.

1. Inginer proiectant la Intreprinderea Industriala de Stat "Automatica"

9,2520

R/011/62/006/001/002/003  
1010/1210

AUTHOR: Landau, Ioan

TITLE: Transistorized differential D.C. amplifiers

PERIODICAL: Automatica si electronica, v. 6, no. 1, 1962, 12-18

TEXT: The three main causes of thermal drift of a transistorized D.C. amplifier, namely variations of  $I_{CBO}$ , of  $E_{BE}$ , and of  $\beta$  are discussed. In order to decrease drift, differential D.C. amplifiers are widely used. Circuit diagrams of differential D.C. amplifiers with symmetrical and unsymmetrical (phase inverter) inputs are given, and their equivalent circuits are discussed. The procedure for computation of the phase inverter amplification is given in the appendix. The author has built and checked both types of differential D.C. amplifiers, as well as a 3-stage differential D.C. amplifier. In order to reduce the thermal drift, transistors of similar  $I_{CBO}$  were selected. For the first stage of amplification transistors with lowest  $I_{CBO}$  were chosen. The constructed amplifier was intended for production of D.C. and A.C. regulators. EFT 153 transistors, produced by Uzina Electrica (Electrical Factory), have been used. The experimental results showed that by use of transistorized D.C. differential amplifiers, a high amplification factor and a sufficient reduction of thermal drift are obtained, so that these amplifiers may be used for automatic regulation and simulation circuits. There are 13 figures, 1 table and 10 references.

Card 1/1

✓  
B

DAMSKER, D.; WEINRICH, G.; LANDAU, I.

A system of regulating the number of revolutions by armature tension and the reduction of flux to a reversible drive, with single reference. Automatica electronica 6 no.3:102-111 My-Je '62.

21260

R/005/60/000/001/002/004  
D264/D301

9,2100

AUTHORS: Cartianu, Gh., Professor, Engineer, and Landau, I.D.,  
Engineer

TITLE: Carborundum varistors without a binding agent

PERIODICAL: Telecomunicații, no. 1, 1960, 16-20

TEXT: The article presents the results of investigations conducted at the Institutul politehnic (Polytechnical Institute) in Bucharest into producing carborundum varistors without a binding agent. These varistors consist of a cylindrical container with two electrodes, into which the carborundum granules are introduced. The apparatus is provided with a mechanical device for compressing the granules. The voltage-current characteristics of different types of varistors are shown in Fig. 4 for the linear scale, and in Fig. 5 for the double logarithmic scale. Mechanical vibrations have a negligible influence on the parameters of the varistor if the material is sufficiently compressed. For varistors operating at voltages below 100 v, it is recommended using electrotechnical carborundum, whereas

Card 1/4

24260

R/005/60/000/001/002/004  
D264/D301

Carborundum varistors without...

for varistors operating at voltages above 100 v, it is recommended using green silicon carbide. The dynamic characteristics of the varistor were established by a cathode oscillator and the wave shape of the current was oscillographed. Up to 20,000 cps, the wave shape of the current remained unchanged. Measurements were accomplished at a-c ( $f = 50$  cps) by the ammeter-voltmeter method. The following conclusions could be drawn from the measurements: After having established the first curve and returned to the initial temperature, the resistance to the initial temperature increased. The differences between the  $R_{\infty} = f(T^{\circ}C)$  curves established initially and subse-

quently, were low for temperature values close to the initial one, but increased at higher temperatures attaining even 5%. The  $R_{\infty} = f(T^{\circ}C)$  curves established finally coincided with the curve established for the second time. The value of resistance to the initial temperature coincided in the case of curves established for the second, third, and fourth times. The admissible dissipating power of varistors with a diameter of  $D = 3$  cm, was 6 w, and that of varistors with a diameter of  $D = 7$  cm, 18 w. The manufacture of varis-

Card 2/4

24260

R/005/60/000/001/002/004  
D264/D301

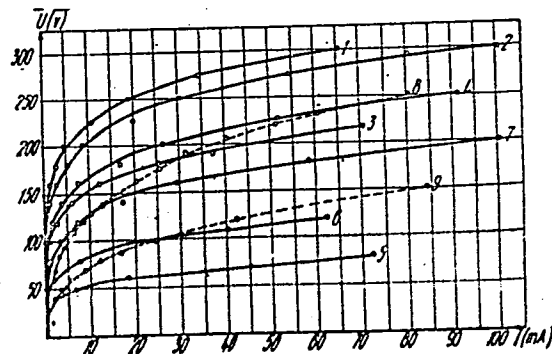
Carborundum varistors without...

tors without a binding agent has the following advantages: It simplifies manufacturing technology, presents a pronounced non-linearity, and by using the same apparatus but modifying the carborundum quantity the characteristics of the varistor can be modified. There are 10 figures and 5 references: 3 Soviet-bloc and 2 non-Soviet-bloc. The reference to the English-language publication reads as follows: K. Henney, Radio Engineering Handbook, McGraw Hill, 1950, p. 108.

Fig. 4.  $U = f(I)$  characteristics of some studied varistor types: 1, 2, 3 - varistors of green carborundum; 4 - varistor of black carborundum; 5, 6, 7 - varistors of electrotechnical carborundum; 8, 9 - varistors with binder.

Fig. 4. Caracteristicile  $U=f(I)$  ale unor tipuri de varistori studiați:

1, 2, 3 - varistori din carborund verde; 4 - varistor din carborund negru; 5, 6, 7 - varistori din carborund electrotehnic; 8, 9 - varistori cu liant.



Card 3/4

23322

R/005/61/000/003/003/004  
D019/D105

9.2100  
AUTHORS: Cartianu, Gh., Professor, Engineer; Landau, I.D., Engineer  
TITLE: Binderless carborundum varistors for low voltage  
PERIODICAL: Telecomunicatii, no. 3, 1961, 107-109

TEXT: On the basis of their previous publication on various types of varistors without binder (Ref. 1: Telecomunicatii, 1960, no. 1, p 16-20), the authors present some experimental results obtained with binderless varistors operating at low voltage. The experiments were conducted with cylindrical varistors, with containers having an internal diameter of 70mm. The carborundum consisted of 0.1-mm granules. The decrease of the voltage, at which the curvature of the voltage-current characteristic appears, was achieved by reducing the thickness of the carborundum layer to a minimum of 0.4mm. For a linear section the formula

$$\log U = \log C + \alpha \log I \quad (1)$$

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23322

R/005/61/000/003/003/004  
D019/D105

Binderless carborundum varistors for low voltage  
may be used, hence:

or

$$U = CI^\alpha \quad (2)$$

$$I = AU^n \quad (3)$$

In the formulas (1), (2), and (3), A and C are constants, while  $n = \frac{1}{\alpha}$ , is the quality-factor of nonlinear resistance. The formula (2) shows that if  $I = 1A$ ,  $U = C$ . Table 1 presents the experimental values of C and of the factors  $\alpha$  and n in binderless varistors. Comparison of these results with the characteristics of varistors with binders shows that: (1) with binderless varistors nonlinearity coefficients comparable to those of varistors with binders may be obtained, but at a much lower voltage; (2) starting with the C value of 20, the  $\alpha$  coefficient of varistors without binders has the same value or even a higher one than that of varistors with binder and (3) with binderless varistors C values up to a minimum of 6,

Card 2/4

23322

R/005/61/000/003/003/004  
D019/D105

Binderless carborundum varistors for low voltage

with a quality factor of  $n \geq 2.6 \div 2.7$ , may be obtained. Experiments proved that the voltage-current characteristic of binderless carborundum varistors in a double logarithmic scale forms two straight-line segments; the curving of the characteristic, however, takes place at  $\approx 2$  v, while the curving of the voltage-current characteristic of varistors with binder takes place at  $\approx 50 \div 100$  v. On the first section of the voltage-current characteristic in the double logarithmic scale the quality factor  $n$  is lower than on the second section. Accordingly, in a binderless varistor with  $C = 6.5$ ,  $n$  is 1.86 on the first and 2.66 on the second portion. Low-voltage varistors are used in error transducers for d-c voltage regulators with transistors and for limiting excess voltage in inductive circuits. Varistors without binder are successfully used in assemblies with transistors requiring the use of low-voltage non-linear resistances. There are 5 figures, 1 table and 3 references: 2 Soviet-bloc and 1 non-Soviet-bloc.

Card 3/4

DAMSKER, Dorel, ing., laureat al Premiului de Stat (Bucuresti);  
WEINRICH, Gunther, ing. (Bucuresti); LANDAU, Ioan D., ing.  
(Bucuresti); BRANA, Codrut, ing. (Bucuresti)

Technical characteristics of transistorized automatic regulating blocks for electric drives. Elektrotehnica 9 no.3:85-96  
Mr.61

1. Sef de laborator la Institutul de Cercetari Electrotehnice (for Damsker).
2. Inginer proiectant principal la "Automatica" (for Weinrich).
3. Inginer proiectant la "Automatic" (for Landau)
4. Cercetator la Institutul de Cercetari Electrotehnice (for Brana).

WEINRICH, G.; LANDAU, I.D.; ANASTASIU, S; CONSTANTINESCU, M.; CHIVARAN, St.

Automatic speed control fo direct current engines  
controlled by thyristors. Probleme automatiz 203-220  
5 N '62.

L 29661-66 EWP(k)/EWP(h)/EWP(l)/EWP(v) BC  
 ACC NRI AP020132 SOURCE CODE: RU/0011/65/009/005/0221/0228

AUTHOR: Weinrich, G. (Engineer; Candidate of technical sciences); Larlay, I. D. 64  
 (Engineer); Mihailescu, I. (Engineer); Constantinescu, H. (Engineer); Gavat, St. E  
 (Engineer)

ORG: none

TITLE: Unified transistorized regulating system for rapid dynamic processes--UNIDIN

SOURCE: Automatica si electronica, v. 9, no. 5, 1965, 221-228

TOPIC TAGS: automatic regulation, transistorized circuit

ABSTRACT: The authors summarize the design and operation of the UNIDIN transistorized automatic regulation system, built in Rumania since 1963-1964, and review the results of its use in various applications. They conclude that the principles underlying the design have proved to be the correct ones, and that its modular construction with standardized elements (printed circuit cards, etc.) offers many advantages from the point of view of construction, installation and operation. Orig. art. has: 5 figures and 1 table. [JPRS]

SUB CODE: 13, 09 / SUM DATE: none / ORIG REF: 004

UDC: 621-523.8

Card 1/1 CC

L 10757-63

EPR/ETP(j)/EPF(c)/ETT(m)/BDS--AFFTC/ASD--Ps-h/Pc-h/Pr-h--

RM/WW  
ACCESSION NR: AP3003291

S/0138/63/000/006/0031/0034 821  
78

AUTHOR: Chuyko, A. A.; Neymark, I. Ye.; Landau, I. M. (Deceased); Tsepenyuk, E. V.;  
Chuyko, Ye. A.

TITLE: Effect of the chemical nature of filler surface and ionizing radiation on  
the properties of rubbers

SOURCE: Kauchuk i rezina, no. 6, 1963, 31-34

TOPIC TAGS: rubbers, SKS-30, SKN-40, SKB; fillers; silica; Belaks; modified silica;  
vinyl-substituted silica; vulcanization; vulcanizate properties; tensile strength;  
modulus; swelling; ionizing radiation, butadiene-styrene rubber; nitrile rubber,  
sodium butadiene rubber; silica surface hydroxyls

ABSTRACT: The effect of the chemical nature of the filler surface on the physico-  
mechanical properties of rubbers has been studied. Butadiene-styrene (SKS-30),  
nitrile (SKN-40) and sodium butadiene (SKB) rubbers loaded with unmodified silica  
and with silica whose surface hydroxyls had been substituted by allyloxy or vinyl  
radicals were used. Use of modified silica in standard rubber mixes (containing  
100 parts rubber and 50 to 60 parts filler) was shown to improve the physico-  
mechanical properties of the vulcanizates. For example, the tensile strength of

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SKN-40 rubber containing 60% filler increased from 126.3 kg/cm<sup>2</sup> with unmodified silica to 163.6-168 kg/cm<sup>2</sup> with vinyl-substituted silica (vinyl silica); the respective values of the modulus at 600% elongation and swelling at equilibrium in benzene were 55.2 and 134 kg/cm<sup>2</sup> and 30 and 15%. This improvement was attributed to greater compatibility of the filler and the rubber and to a reaction between the olefin radicals of the filler surface and the rubber with the possible formation of C-C and C-S-C linkages. The effect was studied of ionizing radiation from a Co<sup>60</sup> source at a dose rate of 77 r/sec on nonloaded SKS-30 rubber and on SKS-30 loaded (ratio 1/1) with unmodified and with modified silica (Belaka) containing 2.5% vinyl, methyl, or ethyl radicals. Irradiation did not affect the tensile strength and the modulus at 100% elongation of unloaded rubber but considerably improved these properties in loaded rubbers, particularly with vinyl silica. The maximum effect of irradiation is attained after 48 hr. These results were attributed to the participation of the filler in the formation of the three-dimensional network. In particular, the allyl or vinyl groups of the filler and the rubber macromolecules form radicals which link the two through the formation of covalent bonds. It is concluded that the structure and the physico-mechanical properties of vulcanizates can be controlled by modifying the nature of the organic radicals on the silica surface, the number of such radicals, the composition of the vulcanizates, and the method of vulcanization. Orig. art. has:

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ACCESSION NR: AP3003291

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1 figure and 2 tables.

ASSOCIATION: Institut fizicheskoy khimii im. L. V. Pisarzhevskogo AN SSSR  
(Institute of Physical Chemistry, AN SSSR); Kiyevskiy regeneratorno-rezinovy'y zavod  
(Kiev Reclaim Rubber Plant)

SUBMITTED: 00

DATE ACQ: 10Jul63

ENCL:00

SUB CODE: 00

NO REF SOV: 004

OTHER: 004

rn/93  
Card 3/3

DZHAPARIDZE, P.N.; LANDAU, I.N.

Dynamographic study of the friction force. Soob. AN Gruz.  
SSR 33 no. 2:309-316 F '64. (MIRA 17:9)

1. Institut prikladnoy khimii i elektrokhimii AN GruzSSR  
Tbilisi. Predstavleno chlenom-korrespondentom AN GruzSSR  
M.M.Mirianashvili.

LANDAU, I. Ya., (Moskva)

Automation of the design of electronic digital computers.  
Avtom. i telem. 25 no.11:1581-1587 N '64 (MIRA 18:1)

5/799/62/000/002/007/011

AUTHORS: Knyazev, V. D., Landau, I. Ya.

TITLE: The magnetic-tape control unit of the computing machine M-2.

SOURCE: Akademiya nauk SSSR. Institut elektronnykh upravlyayushchikh mashin. Tsifrovaya tekhnika i vychislitel'nyye ustroystva. no. 2, 1962, 98-109.

TEXT: The magnetic-tape memory unit (MTMU) is employed as an external memory unit for the storage of great amounts of information for the digital computer M-2 of the INEUM (Institute of Electronic Control Machines), AS USSR. The 18.75-mm wide magnetic tape (MT) contains zones with 34-digit binary numbers. The 500 m of a single length of MT contain 400 zones (204,800 number or  $7.10^8$  binary bits). There are 4 information and 2 service tracks. Recording of information is done by the pulse method on saturation-magnetized MT; only the "1" digits are recorded. Recording and playback is done by the parallel-series method synchronously with prerecorded markers. Each number is divided into 9 columns having 4 binary bits per column (the last column contains 2 bits). At the tape speed of 2 m/sec, the recording density is 3.75 pulses/mm of tape length. The reading time of one zone is 0.6 sec; starting and stopping time is 5 msec. The MTMU contains a control unit and a tape-driven unit. The MTMU can operate in the following regimes: (a) MT marking, (b) zone search, (c) information recording in one zone

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The magnetic-tape control unit . . . .

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(512 numbers), (d) playback of one recorded zone, (e) erasing of the information of one zone, (f) bulk erasing of information. Marking of the MT comprises the recording of service information for 400 zones, that is, 4608 markers for each zone, in one service track and the address markings in the other service track. A schematic drawing of the placement of the information and service markings on the MT is shown. A block scheme of the MT control unit is provided, also a schematic diagram of the MT-marking network. A full-page schematic network diagram of the zonal-search network is shown. A schematic network diagram of the recording network is shown, together with a detailed explanation, both for the recording and the playback mode. The operation of the erase mode is described. The control board, with its controlling and monitoring functions, is described. 3 control programs, designed for the daily check of the operation of the machine and the MTs, are described. Program no. 1 verifies the operation of the tape deck, tape-drive control, and the connection between the machine and the control block; this program consists of a multiply-repeated command cycle: "Search, erase, search, leadout, search, leadin, . . . ., etc.". Program no. 2 provides a verification of the operation of the recording and readout control block. Program no. 3 is intended essentially for the verification of the quality of the magnetic tape. Program no. 2 was used to verify the storage time of recorded "1's" on the MT (Type 4) with continual return to the same zone. It was found that under such conditions up to 250 correct readouts were feasible, after which first isolated and then multiple skips (to "0") on all tracks occur. There are 5 figures.

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AFWL/SSD/AFMD(p)/AFETR/AFTC(b)/RAEH(d)/ESD(dp) GG/BB  
ACCESSION NR: AP5000151 S/0103/64/025/011/1581/1587

AUTHOR: Landau, I. Ya. (Moscow)

TITLE: Automation of the design of digital computers 16C

SOURCE: Avtomatika i telemekhanika, v. 25, no. 11, 1964, 1581-1587

TOPIC TAGS: computer design, digital computer, programming, simulation unit/M-2 computer

ABSTRACT: The use of computers for some of the stages of digital computer design is considered. A detailed logical circuit is selected as input information for the discussion. Two programs are put forward to provide 1) a check of the conformance of the logical circuit with the specifications and 2) the establishment of a functional scheme on the basis of the logical one. The functional layout constitutes the input for programs of subsequent design stages. Both programs are intended to be used for preparing schemes consisting of six types of potentially interconnected elements: trigger; "and" and "or" diode elements; "not"-circuit; delay line; kipp-relay; power amplifier; shaper. Input-signal amplitudes and output currents of all elements are assumed to be

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ACCESSION NR: AP5000151

the same, so that the load on any element is determined simply by the number of elements with which it is connected. The running list of logical formulas in standard symbols of Boolean algebra is coded by two methods: an external coding for writing initial information to be put into the computer, and an internal coding on which the program operates. A program for verifying logical schemes by simulating the operation of the checked computer system on the basis of the given initial state is developed. It is based on special subroutines called "simulation units." The following subroutines are examined: input-output generator; modeling subroutine; "increase of time" subroutine; and "comparison of outputs" subroutine. While complete verification of the logical scheme by this method is not possible, all commands of the computer under design can be checked in this way, which is adequate for control systems. A program for the functional layout is established on the basis of the logical scheme and the list of output signals of the computer being designed. The program provides for the necessary supplementary elements which do not carry logical functions (such as amplifiers and shapers). Both programs and subroutines are written for the M-2 computer of the Institute of Electronic Control Machines. The basic parameters of this computer are as follows: speed, approx

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ACCESSION NR: AP5000151

1700 operations per second; size of operational memory, 4096 cells; length of each cell, 34 binary columns. Circuits containing approximately 200 triggers can be introduced into the computer. A single cycle takes about 30 seconds. The establishment of the functional scheme took three hours (without a printout)—in comparison with the 10 man-days normally required for manual computation. Orig. art. has: 4 figures, 2 formulas, and 2 tables.

ASSOCIATION: none

SUBMITTED: 30May63

NO REF SOV: 000

ENCL: 00

OTHER: 003

SUB CODE: DP

ATD PRESS: 3165

Card 3/3

LANDAU, JOSEF

Hydraulic analog for the study of heat exchangers. II. Analog with a capillary of variable conductance for a counter-current heat exchanger. Jaroslav Procházka, Josef Landau, and George Standart (Vysoká škola chem. technol., Prague). *Chem. Abstr.* 51, 740-3 (1957); cf. *C.A.* 48, 9763i. — Relations are given for the detn. of the dimensions of individual parts of a hydraulic analog of a counter-current heat exchanger. The construction and properties of a capillary with adjustable length and its calibration are described. Two illustrations for const. and variable heat-transfer coefficients are given. Brdos.

JP  
NT

CZECHOSLOVAKIA/Chemical Technology. Chemical  
Products and Their Applications.  
Chemical Engineering.

H-2

Abs Jour : Ref Zhur-Khimiya, No 7, 1959, 23618

Author : Prochazka, J., Landau, J., Standart, G.

Inst : -

Title : Utilization of the Hydraulics Analogy in the  
Study of Heat Exchangers. III. Universal Ana-  
logue.

Orig Pub : Chem. listy, 1958, 52, No 5, 830-838

Abstract : Described is the construction of a hydraulic  
analogue, that permits study of heat exchan-  
gers having parallel and counter-flows, multi-  
pass heat exchangers of various types, heat  
exchangers that handle 3 or more different  
heat exchange media simultaneously, and also

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H-3

AUTHORS: Landau, J. and Procházka, J. CZ/8/52(82)/10-24/39

TITLE: The Course of Homogenisation During Mixing. Preliminary  
Communication (Sledování homogenisace při míchání.  
Předběžné sdělení)

PERIODICAL: Chemické Listy, Vol 52(82), Nr 10, pp 1989-1990 - 1958  
(Czechoslovakia)

ABSTRACT: The paper gives practical details for a study of the  
problem of homogenisation of miscible substances by  
mechanical mixing. The rate of homogenisation of NaCl  
in a large volume of water (or aqueous glycerine  
solutions) is followed conductimetrically. The electric  
circuit of the apparatus and some results obtained are  
given.

There are 3 figures and 5 references, 1 of which is  
Czech, 4 English.

ASSOCIATION: Katedra procesů a aparátů chemické technologie,  
Vysoká škola chemicko-technologická, Praha  
(Department of Processes and Apparatus in Chemical  
Technology, Technical University of Chemical Technology,  
Prague)

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CZ/8/52(82)/10-24/39  
The Course of Homogenisation During Mixing. Preliminary  
Communication

SUBMITTED: February 11, 1958

Card 2/2

LANDAU, J.

hE3b  
Distr: hE3c 2 cys/hE2b(v)

✓ Hydraulic analog for studying steady-state heat ex-  
changers. VJ. Procházka, J. Landau, and G. Standart  
(Inst. Chem. Tech., Prague). *Brit. Chem. Eng.* 5, 242-7  
(1960).—Hydraulic analogs are described for counter- and  
mixed-flow steady-state heat exchangers, illustrated by 2  
examples, 1 being a 3-stream low-temp. unit. M. P. Reed

85

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1-RS  
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PROCHAZKA, J.; LANDAU, J.

Studies on mixing. Part 12: Homogenization of miscible liquids in turbulent region. Coll Cz Chem 26 no.12:2961-2973 D '61.

1. Institute for Chemical Process Fundamentals, Czechoslovak Academy of Science and Department of Chemical Engineering, Institute of Chemical Technology, Prague.

LANDAU, J.; PROCHAZKA, J.

Studies on mixing. Part 11: Experimental methods for following the homogenation on miscible liquids by rotary mixers. Coll Cz Chem 26 no.8:1976-1990 '61.

1. Department of Chemical Engineering, Institute of Chemical Technology and Institute of Process Fundamentals, Czechoslovak Academy of Sciences, Prague.

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LANDAU, J.; PROCHAZKA, J.; VACLAVEK, V.; FORT, I.

CSER

Institute of Chemical Technology, Prague, and Institute of Chemical  
Process Fundamentals, Czechoslovak Academy of Sciences, Prague  
(for all)

Prague, Collection of Czechoslovak Chemical Communications, No 2, 1963,  
pp 279-292

"Studies of Mixing. XIV. Homogenation of Miscible Liquids in the  
Viscous Region"

(4)

LANDAU, J.

CZECHOSLOVAKIA

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LANDAU, J; PROCHAZKA, J; POLASEK, F.

1. Institute of Chemical Process Fundamentals; 2. Czechoslovak Academy of Science and Department of Chemical Engineering; 3. Institute of Chemical Technology, Prague - (for all)

Prague, Collection of Czechoslovak Chemical Communications,  
No 5, 1963, pp 1093-1101

"Studies on Mixing. XV. Effect of Directing of Flow on the Homogenization of Miscible Liquids by Rotary Mixers."

LANDAU, J.

Mass 1

CZECHOSLOVAKIA

PROCHAZKA, J; LANDAU, J.

Institute of Chemical Process Fundamentals, Czechoslovak Academy of Science, Prague (for all)

Prague, Collection of Czechoslovak Chemical Communications,  
No 5, 1963, pp 1102-1109

"Studies on Mixing. XVI. Exact Determination of Power Consumption of Rotational Mixers."

CZECHOSLOVAKIA

PROCHAZKA, J; LANDAU, J.

Institute of Chemical Process Fundamentals of the  
Czechoslovak Academy of Sciences, Prague (for  
both)

Prague, Collection of Czechoslovak Chemical Communications,  
No 8, 1963, pp 1927-1945

"Studies on Extraction. I. Back-mixing and Efficiency  
of Continuous Stagewise Countercurrent Extraction  
Process."

LANDAU, J.; PROCHAZKA, J.; VACLAVEK, V.; FORT, I.

Studies on mixing. Pt.14. Coll Cz Chem 28 no.2:279-292  
F '63.

1. Institute of Chemical Technology, Prague and Institute  
of Chemical Process Fundamentals, Czechoslovak Academy of  
Sciences, Prague.

LANDAU, J.

LADND AU, J.; PROCHAZKA, J.; POLASEK, F.

Studies on mixing. Fts. 15-16. Coll Cz Chem 28 no. 5:  
1093-1109 My '63.

1. Institute of Chemical Process Fundamentals, Czechoslovak Academy of Sciences, Prague (for Landau and Prochazka).
2. Department of Chemical Engineering, Institute of Chemical Technology, Prague (for Polasek).

PROCHAZKA, J.; LANDAU, J.

Studies on extraction. Pt.1. Coll Cz Chem 28 no.8:1927-1945 Ag  
'63.

1. Institute of Chemical Process Fundamentals, Czechoslovak Academy of Sciences, Prague.

LANDAU, J.; PROCHAZKA, J.

Studies on mixing. Pt. 17. Coll Cz chem 29 no.8:1866-1877 Ag '64.

1. Institute of Chemical Process Fundamentals, Czechoslovak  
Academy of Sciences, Prague.

LANDAU, J.; PROCHAZKA, J.; SOUHRADA, F.; NEKOVAR, P.

Studies on extraction. Pt. 2. Coll (z Chem 29 no.12: 93-3019  
D '64.

1. Institute of Chemical Process Fundamentals of the Czechoslovak Academy of Sciences, Prague (for Landau, Prochazka and Souhrada).
2. Department of Chemical Engineering of the Institute of Chemical Technology, Prague (for Nekovar).

PROCHAZKA, J.; LANDAU, J.; NEKOVAR, P.; SOUHRADA, F.

Studies on extraction. Pt.3. Coll Cz Chem 30 no.1:158-168 Ja '65.

1. Institute of Chemical Process Fundamentals of the Czechoslovak Academy of Sciences, Prague. Submitted March 21, 1964.

CZECHOSLOVAKIA

LANDAU, J; PROCHAZKA, J; LUTOVSKY, Z

1. Institute of Chemical Process Fundamentals, Czechoslovak Academy of Sciences, Prague-Buchdol - (for Landau and Prochazka); 2. Chemoprojekt, Prague - (for Lutosky)

Prague, Collection of Czechoslovak Chemical Communications, No 5, May 1966, pp 1992-1998

"Studies on extraction. Part 7: Calculation of stagewise extraction with back-mixing."

LANDAU, L.

"Stockbreeding in the Light of Modern Soviet Agrobiology." p. 163, Bratislava, Vol. 6, 1951.

SO: East European Accessions List, Vol. 3, No. 9, September 1954, Lib. of Congress

LANDAU, L

✓ Feeding of domestic animals with protein-rich feed yeasts.  
L. Landau. *Pishevodstvo* 1, 181-95(1954).--The problems of adequate protein-contg. animal feed are discussed. Exptl. results on hogs and chickens fed with yeast grown on sulfite-waste liquor were encouraging. T. Jurcek

Landau, Ladislav

Effect of a constant addition of  $\beta$ -carotene in the green fodder on the usefulness and health of chickens. Ladislav Landau and Adolf Spronc. *Pol'nohospodárstvo* 3, 61-80 (1955). Two groups of 280 white Leghorns each were used in the expts. The first group obtained fresh green fodder from the second day after birth until the 14th month. The second group obtained the usual standard mixt. of food and had the seasonal privilege of eating outside on the green pasture. All other environmental factors were kept as equal as possible. The authors noted a distinct advantage of the first group of animals over the second group in respect to growth, weight, attainment of puberty, ability to lay eggs, capability of eggs to hatch, and health of the animals. Details are given and a very complete literature is cited.

Otto R. Lobstein

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